

SHALIMOV, G.E.

Production line for doors made of boards and filled with  
curled shavings. Der.prom. 8 no.6:28-29 Je '59.

(MIRA 12:8)

(Finland--Doors)

SHALIMOV, G.L.

Mass production line for manufacturing small boards for boxes.  
Der.prom. 9 no.2:30 F '60. (MIRA 13:6)  
(Kotka, Finland--Woodworking industries)

SHALIMOV, G.L.

Improving the accuracy of automatic manufacture of parts from small square pieces of wood. Der. prom. 12 no.1:7-8 Ja '63.

(MIRA 16:5)

1. Spetsial'noye konstruktorsko-tekhnologicheskoye byuro po derevoobrabatyvayushchey mashinostroyeniyu Moskovskogo gorodskogo soveta narodnogo khozyaystva.

(Woodwork)

SHALIMOV, I.

Radio direction finding receiver operating on 144 to 146 mc.  
Radio no.4:37-38 Ap '61. (MIRA 14:7)

1. Radiostantsiya UA3AEF.  
(Radio direction finders)

SHALIMOV, I.F.; VADETSKIY, Yu.V.; SAVINA, Z.A., redaktor; POLOSINA, A.S.,  
tekhnicheskiiy redaktor

[Use of the turbine drill powered by diesel drive] Praktika  
turbinного бурения на дизельном приводе. Moskva, Gos. nauchno-  
tekhn. izd-vo nef'tianoi i gorno-toplivnoi lit-ry, 1954. 242 p.  
(Boring machinery) (MLRA 7:10)

VODETSKIY, Yuriy Vyacheslavovich; SHALIMOV, Ivan Fedorovich; STRIZHOV, N.I.,  
redaktor; BEKMAN, Yu.K., vedushchiy redaktor; TROFIMOV, A.V.,  
tekhnicheskiiy redaktor

[Drilling oil and gas wells] Burenie neftiannykh i gazovykh skvazhin.  
Moskva, Gos. nauchno-tekhn. izd-vo neftianoi i gorno-toplivnoi lit-ry,  
1956. 418 p. (MIRA 9:12)  
(Oil well drilling)

BOBRYAGIN, V.I.; LEVCHENKO, I.A.; PRUDEN, I.I.; SHCHERBA, V.I.

Sound produced by honeybees during their signal movements.  
Dokl. AN SSSR 196 no.3:753-756, 1966.

(MIRA 19:1)

1. Izvestiya zoologii AN UKRSSR. Submitted March 10, 1965.

TARTAKOVSKIY, Boris Nusimovich; VARSHAVSKIY, Anatoliy Mikhaylovich;  
SHALIMANOV, Iosif Petrovich; NURUKHAMEDOVA, V.F., red.izd-  
va; MAKSIMOVA, V.V., tekhn.red.; LOMILINA, L.N., tekhn.red.

[Mechanization of railroad track relocation in open-pit  
mines] Mekhanizatsiia peredvizhki zheleznodorozhnykh putei  
na kar'erakh. Moskva, Gosgortekhzdat, 1963. 183 p.  
(MIRA 16:10)

(Mine railroads--Track)



SHALIMOV, K.; SHABALOV, V.

We are working in a new way. Mast. ugl. 6 no. 9:7-8 S :57. (MIRA 10:11)

1. Upravlyayushchiy trestom Leninugol' kombinata Voroshilovgradugol' (for Shalimov).
2. Nachal'nik tekhnicheskogo otdela (for Shabalov).  
(Coal mines and mining)

SHALIMOV, K.V.

On a schedule providing for a continuous work cycle. Ugol' Ukr.  
2 no.12:5-6 D '58. (MIRA 12:1)

- 1.Upravlyayushchiy trestom Leninugol'.  
(Coal mines and mining)

SHALIMOV, K.

Coal niche-cutting saw. Mast.ugl. 7 no.4:18-19 Ap '58. (MIRA 11:4)

1. Upravlyayushchiy trestom Leninugol' kombinata Luganskugol'.  
(Coal mines and mining--Equipment and supplies)

SHALIMOV, K.

We shall save more than three million rubles. Mast. ugl. 7  
no. 9:11-12 S '58. (MIRA 11:10)

1. Upravlyayushchiy treestom Leninugol' kombinata Luganskugol'.  
(Coal mines and mining--Costs)

SHALIMOV, K.

Continuous cycles. Mast. ugl. 8 no.1:3-4 Ja '59. (MIRA 12:3)

1. Upravlyayushchiy trustom Leninugol' Luganskogo sovnarkhoza.  
(Coal mines and mining)

SHALIMOV, K.

Progress of the seven-year plan. Mast.ugl. 9 no.5:3 My '60.  
(MIRA 13:7)

1. Upravlyayushchiy trestom Leninugol' Luganskogo sovnarkhoza.  
(Lugansk Province--Coal mines and mining)

SHALIMOV, K.V.

Organizing a speedy drifting of hauling entries. Ugol' Ukr. 5  
no.7:30-31 J1 '61. (MIRA 15:1)

1. Upravlyayushchiy trestom Leninugol'.  
(Coal mines and mining)

SHALIMOV, K.V.

Mining 1051 meter of haulage drift per month. Ugol' Ukr. 6  
no.5:28-29 My '62. (MIRA 15:11)

1. Upravlyayushchiy Leninskim trestom kombinata Kuzbassugol'  
Ministerstva ugol'noy promyshlennosti SSSR.  
(Kuznetsk Basin--Coal mines and mining--Labor productivity)



POCHENKOV, Ye.; SAPITSKIY, K.; SHALIMOV, M.

Sources of lower cost of coal. Mast.ugl. 3 no.1:18-19 Ja '54.  
(MIRA 7:1)

(Coal mines and mining)

SHALIMOV, Mikhail Georgiyevich, kandidat tekhnicheskikh nauk; NOVITSKIY,  
Viktor Mikhaylovich, kandidat tekhnicheskikh nauk; KLIMOV, V.F.,  
kandidat tekhnicheskikh nauk, redaktor; KHITROV, P.A., tekhnicheskii  
redaktor

[Automatic and remote control of traction substations for railroads]  
Avtomatika i telemekhanika tiagovykh podstantsii zheleznnykh dorog.  
Moskva, Gos.transp. zhel-dor. izd-vo, 1955. 216 p. (MIRA 9:2)  
(Automation) (Electric railroads--Substations)

SHALIMOV, M.G.

Translation from: Referativnyy Zhurnal, Elektrotehnika, 1957  
p. 129 (USSR)

AUTHOR:

Shalimov, M.G.

TITLE:

Smoothing Devices in Traction Substations for Unbalanced Electric Power Transmissions (Sglazhivayushchiye ustroystva tyagovykh podstantsiy pri nesimmetrichnykh elektropperedachakh)

PERIODICAL: Sb. nauch. tr. Tomskiy elektromekhan. inzh. zh.-d. transp., 1955, Vol. 21, pp. 131-144

ABSTRACT: One of the measures for improving reliability and continuity of service of railroad electric power supplies is the use of phase-sequence cut-off of electric transmission lines, in conjunction with single-phase automatic reclosing, which insure normal operation of substation mercury-arc rectifiers and obviate the need for constructing double-circuit transmission lines, thus greatly reducing preliminary capital expenditures for the primary system of the railroad electric power supply. However, when phases of electric power lines are cut-off, the

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Card 1/3

APPROVED FOR RELEASE: 08/23/2000

CIA-RDP86-00513R001548420001-6"

...ion Substations for Unbalanced Electric  
... wave shape of the rectified voltage is decreased and a decrease in average value of rectified voltage causing a reduction in train speed is not adversely reflected in the graphic timetable, and a distortion in wave shape does not seriously affect the operating conditions of railroad rolling stock traction motors. The only factor impeding the adoption of phase-sequence cut-off is an increase in the effect of traction currents on the operation of communication devices caused by the distortion of the shape of the rectified voltage; this effect can be eliminated by the application of suitable smoothing devices. The author suggests that existing aperiodic (choke) smoothing devices consisting of a wavetramp with bank of capacitors which are capable of smoothing out harmonics of any order contained in the rectified voltage, and operating with variations in current frequency in the power supply system. Presented are

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Smoothing Devices in Traction Substations for Unbalanced Electric  
Power Transmissions 112-3-5957

) an analysis of the properties of the aperiodic smoothing  
device, computation of the capacitances required for  
obtaining resonance conditions for the various harmonics,  
and the most advantageous capacitance of the capacitors.  
L.A.Ch.

ASSOCIATION: Tomsk Electro-Mechanical Institute for Railroad  
Engineering (Tomskiy elektromekhan. in-t inzh. zh.-d.  
transp.)

Card 3/3

SHALIMOV, M.G.; GOLIKOV, Ye.Ye.; PONOMAREV, A.A.

P.A. Azbukin; on his 80th birthday and the 55th anniversary  
of his theoretical and educational work. Elektrichestvo  
no.8:92-93 Ag '62. (MIRA 15:7)  
(Azbukin, Pavel Andreevich, 1882-)

BENESHEVICH, I.I., kand. tekhn. nauk; OVLASYUK, V.Ya., kand. tekhn. nauk; SUKHOPRUDSKIY, N.D., kand. tekhn. nauk; SHALIMOV, M.G., kand. tekhn. nauk; BANVER, Z.M., inzh., retsenzent; KOLISH, L.G., inzh., retsenzent; KALININ, V.K., kand. tekhn. nauk, red.; USENKO, L.A., tekhn. red.

[Automation and remote control of the power supply systems of electric railroads] Avtomatizatsia i teleupravlenie ustroistvami energosnabzhenia elektricheskikh zheleznikh dorog. Moskva, Transzheldorizdat, 1963. 359 p.

(MIRA 16:7)

(Electric railroads--Substations) (Automation)  
(Remote control)

BENESHEVICH, I.I., kand. tekhn. nauk; OBLASYUK, V.Ya., kand. tekhn. nauk; SUKHOPRUDSKIY, N.D., kand. tekhn. nauk; SHALIMOV, M.G., kand. tekhn. nauk; BANVER, Z.M., inzh., retsenzent; KOLISH, L.G., inzh., retsenzent; NECHAYEV, N.A., kand. tekhn. nauk, retsenzent; KALININ, V.K., kand. tekhn. nauk, red.; USENKO, L.A., tekhn. red.

[Automation and remote control in the power supply systems of electric railroads] Avtomatizatsiia i teleupravlenie ustroystvami energosnabzheniia elektricheskikh zheleznnykh dorog.

[By] I.I. Beneshevich i dr. Moskva, Transzheldorizdat, 1963.  
359 p. (MIRA 16:9)

(Electric railroads--Current supply)

DUBROVSKIY, V.P.; YEREMIN, N.Ye.; SHALIMOV, M.G.

Calculation of current nonsymmetry in the elements of an electric  
power system feeding a single-phase a.c. railroad with commercial  
frequency. Trudy TEIIZHT 35:77-84 '62. (MIRA 16:8)  
(Electric railroads--Current supply)



DUBROVSKIY, V. P., inzh.; YEREMIN, N. Ye, inzh.; SHALIMOV, M. G.,  
kand. tekhn. nauk, dotsent

Analysis of the operation of a three-phase three-winding trans-  
former in nonsymmetrical operation. Trudy OMIIT 37:91-101 '62.  
(MIRA 17:5)

BARKOVSKIY, B. S., inzh.; YEREMIN, N. Ye, inzh.; KOZLOV, V. N., inzh.;  
NEBOLYUBOV, Yu. Ye, kand.tekhn.nauk, dotsent; SHALIMOV, M. G.,  
kand.tekhn.nauk, dotsent

Effect of the traction load on the turbogenerators of electric  
power plants supplying single-phase 50 c.p.s. power to electric  
railroads. Trudy OMIIT 37:146-150 '62. (MIRA 17:5)

BERKOVSKIY V.S., inzh.; OSADCHYI, A.N., inzh. Primarni uchastiye: STETSENKO,  
N.V.; LOZAREV, M.I.; AVDUNIN, P.M.; SHUMILOV, M.I.; IVANISHKIN, A.Ya.;  
OVRCHIKIN, V.I.; POVETKIN, G.I.; SHEVARDIN, V.I.

Grooving for the rolling of strip with acute angles. Stal' 23 no.7:  
627-631 J1 '63. (MIRA 16:9)  
(Rolling (Metalwork)) (Rolls (Iron mills))

SEAL: V, Mikhail Nikitich; SELOV, A.F., red.

[Aleksel Brezhnev, a bulldozer operator] Aleksei Brezhnev,  
bul'dozerist. Khabarovsk, Khabarovskoe knizhnoe izd-vo,  
1963. 11 p. (MIRA 18:3)

SHALIMOV, M.P., red.; TOSS, A.I., tekhn.red.

[Guide for ships entering Soviet ports in the Sea of Japan and Sea of Okhotsk] Rukovodstvo dlia zakhoda sudov v sovetskie porty Iaponskogo i Okhotskogo morei. 1957. 110 p. (MIRA 12:11)

1. Russia (1923- U.S.S.R.) Voenno-morskoy flot. Upravleniye nachal'nika gidrograficheskoy sluzhby voenno-morskogo flota. (Japan, Sea of--Navigation) (Okhotsk, Sea of--Navigation) (Soviet Far East--Harbors)

SALMANOV, Aleksandr Semenovich, assistant; SHALIMOV, Sergey Ivanovich.  
nauchnyy sotrudnik; VEN'YAMINOV, A.N., doktor sel'skokhoz.nauk,  
red.; GRIGOROVICH, A.T., red.; SZRADZSKAYA, P.G., tekhn.red.

[Viticulture] Kul'tura vinograda. Voronezh, Voronezhskoe  
knizhnoe izd-vo, 1959. 41 p. (MIRA 14:1)

1. Kafedra sadovodstva Voronezhskogo sel'skokhozyaystvennogo  
instituta (for Salmanov). 2. Rossoshanskaya plodovo-yagodnaya  
stantsiya (for Shalimov).  
(Viticulture)

SHALIMOV, S.

Hydraulic connection system of a dishwashing machine. Obshchestv.pit.  
no.9:43-44 S '60. (MIRA 13:11)

1. Nachal'nik trgovo-proizvodstvennogo otdela Kiyevrestorantresta.  
(Dishwashing machines)

SHALIMOV, V., sud'ya vsesoyuznoy kategorii

Fliers from Kazan have kept their promise. Kryl.rod. 12 no.10:  
20-22 0 '61. (MIRA 15:2)

(Kazan--Helicopters)



SHALIMOV, V. A.

Jun 52

USSR/Chemistry, Biology - Theory,  
Ideology

"The Significance of I. P. Pavlov's Work for  
Soviet Biochemistry," V. A. Shalimov.

"Priroda" Vol 41, No 6, pp 54-59

Shalimov outlines I. P. Pavlov's work in bio-  
chemistry, emphasizing its significance for  
the subsequent development of Russian biochem-  
istry. Draws a parallel between dynamic bio-  
chemistry and functional biochemistry, stating  
that the latter, which is advocated by the lead-  
ing Soviet school, permits active interference

229T22

with physiol processes and mastery over them. Says  
that Soviet biologists regard metabolism as depen-  
dent on reflex activity, which in turn is influ-  
enced by the external and int environment of the  
organism.

229T22

SHALIMOV, V. A.

Chemical Abst.  
Vol. 48  
Apr. 10, 1954  
Biological Chemistry

(3)  
Technique of inducing experimental uremia in white rats.  
A. V. Sosunov and V. A. Shalimov (I. P. Pavlov Med. Inst.,  
Ryazan). *Farmakol. i Toksikol.* 16, No. 5, 60-3 (1953).  
Uremia, induced in rats by painting the exposed kidneys  
with 10% tincture of I, was fatal in 1 to 45 days. Residual  
N content of arterial blood, normally 27-39, rose to 55 mg.  
% in venous blood, normally 29-38, to 68 mg. %. There  
were also changes in the arginase, urease, and carboxylase  
activities in lungs, kidneys, spleen, and gastric mucosa.  
Julian F. Smith

SHALIMOV, V.A.

Amount of certain reactive blood protein groups in chronic mercury poisoning. Farm. i toks. 23 no.1:67-71 Ja-F '60. (MIRA 14:3)

1. Kafedra biologicheskoy khimii (zav. - prof. G.A.Uzbekov) Ryazanskogo meditsinskogo instituta imeni I.P.Pavlova.  
(MERCURY--TOXICOLOGY) (BLOOD PROTEINS)

SHALIMOV, V.A.

Studies on tissue respiration during the process of the development of experimental atherosclerosis. Vop. med. khim. 8  
no. 5:471-476 S-0162 (MIRA 17:4)

1. Biokhimiicheskaya laboratoriya eksperimental'nogo otdela  
TSentral'nogo nauchno-issledovatel'skogo instituta kurortologii  
i fizioterapii, Moskva.

SHALIMOV, I.S.

Case of apoplexy of the ovary in pregnancy. Abstract. 1 fig. no.6:128  
N-D '63. (MIRA 17:12)

1. Iz Tyumskoy rayonnoy bol'nitsy (glavnyy vrach B.S.Mukambetov)  
Kirgizskoy SSR.

SHALIMOV, V.A.

Effect of hydrogen sulfide baths on tissue respiration in  
experimental atherosclerosis. Vop. kur., fizioter. i lech.  
fiz. kul't. 29 no.1:40-44 '64. (MIRA 17:9)

1. Biokhimicheskaya laboratoriya (zav.- dotsent V.A. Shalimov)  
eksperimental'nogo otdela (zav.- prof. F.D. Vasilenko) Tsentral'-  
nogo instituta kurortologii i fizioterapii, Moskva.

GRIGOR'YAN, D.G.; SHALIMOV, V.A.

Electrophoretic analysis of cardiac muscle proteins in experimental atherosclerosis. Biul. eksp. biol. i med. 57 no. 2:61-64 F '64. (MIRA 17:9)

1. Laboratoriya biokhimi (zav. - dotsent V.A.Shalimov)  
eksperimental'nogo otdela (zav. - prof. F.D.Vasilenko)  
TSentral'nogo instituta kurortologii i fizioterapii (dir. -  
kand. med. nauk G.N.Pospelova). Predstavlena doystvitel'ny  
chlenom AMN SSSR N.N.Zhukovym-Verezhnikovym.

GRIGOR'YAN, D.G.; SHALIMOV, V.A.

Study of the electrophoretic protein fractions of the myocardium  
in the process of developing atherosclerosis. Biul. eksp. biol.  
i med. 59 no.6:56-58 Je '65. (MIRA 18:6)

1. Laboratoriya biokhimii (zav. - dotsent V.A. Shalimov) ekspe-  
rimental'nogo otdela (zav. - prof. F.D. Vasilenko) Tsentral'nogo  
instituta kurortologii i fizioterapii (dir. - kand. med. nauk  
G.N. Pospelova), Moskva.



SHALIMOV, V.N.

for expanding the production and lowering the cost of ethereal  
oil producing crops. Masl.-zhir.prom. 26 no.9:32-34 S '60.  
(MIRA 13:8)

1. Krymskiy filial Vsesoyuznogo nauchno-issledovatel'skogo  
instituta maslichnykh i efiromaslichnykh kul'tur.  
(Crimea--Essences and essential oils)

SHALIMOV, V.N.; TANASIYENKO, F.S.

System of payment for ethereal-oil producing raw materials. Masl.-  
zhir.prom. 26 no.10:18-30 0 '60. (MIRA 13:10)

1. Krymskiy filial Vsesoyuznogo nauchno-issledovatel'skiy instituta  
mashlichnykh i efiromaslichnykh kul'tur.  
(Essences and essential oils)

SHALIMOV, V.N., starshiy nauchnyy sotrudnik; MIN'KOV, B.P., mladshiy  
nauchnyy sotrudnik

Using the preparation 2,4-D in rose plantations. Zashch. rast. ot  
vred. i bol. 8 no.2:27 F '63. (MIRA 16:7)

1. Krymskiy filial Vsesoyuznogo instituta maslichnykh i  
efiromaslichnykh kul'tur.  
(Roses) (2,4-D)

E2d(v)/Flb(g)

27045  
S/534/61/000/020/001/002  
D208/D301

AUTHORS: Stanyukovich, K.P., and Shalimov, V.P.

TITLE: On the motion of meteor bodies in the earth's atmosphere

PERIODICAL: Meteoritika, 1961, no. 20, 54-71

TEXT: The motion of meteor bodies in the earth's atmosphere is normally treated by two different methods, depending on the ratio of the mean free path of the air molecules at the given altitude to the linear dimensions of the body. If the ratio is large then one can consider individual collisions between the molecules and the body, while in the case of a small ratio, the hydrodynamic approximation may be employed and the medium may be considered continuous. A further effect which must be considered is the formation of a shock wave, for velocities in excess of, say, 10 km/sec. The present paper is divided into two parts: the first part is concerned with the motion of a meteor body before the appearance of the shock wave, while the second part is devoted to shock-wave effects. It is shown in the first part that the coefficient  $C_x$  in

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S/534/61/000/020/001/002  
D208/D301

On the motion ...

the usual aerodynamic relation

$$-M \frac{du}{dt} = \frac{C_x}{2} S \rho u^2. \quad (18)$$

(M - mass of the body, u - its velocity, S - the cross section and  $\rho$  - the density) is given by (in the case of iron).

$$C_x = 2 + 0,16 \cdot 10^6 \left[ \frac{9}{u} + 2,4 \cdot 10^{-12} u \right] \quad (24)$$

A general and more complicated formula which can be used with other materials is also given. The values of  $C_x$  obtained on the basis of the present theory are said to be larger than those predicted previously by other workers. This is in agreement with satellite data and means that the atmospheric density deduced previously from meteor observations may have been too high. In the second part of this paper the authors derive a number of formulae describing the shock-wave effects. The results obtained for iron are conveniently summarised in Fig. 3. This figure gives energy ( $W \cdot 10^{-12}$  erg  $cm^{-2}$  sec $^{-1}$ ) versus altitude (H.km) plots for iron ( $r_0 = 10^2$  cm).

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D208/D301

On the motion...

$u_0 = 60$  km/sec; angle between the vertical and the direction of motion  $\psi = 72^\circ$ ). The curve designations are as follows: curve 1 - total energy received by the body, curve 2 , radiation from shock wave, curve 3 - aerodynamic heating, curve 4 - energy lost by evaporation. The phenomenon is seen to be equivalent to an "explosion", the energy involved being very large. There are 3 figures, 3 tables and 12 references: 11 Soviet-bloc (1 translated from English) and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: D.R. Davies, Proc. Roy. Soc. 61, 105, 1948. 4

(For Fig. 3 see Card 4)

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ACCESSION NR: AT4035830

S/2534/64/000/024/0070/0074

AUTHOR: Shalimov, V. P.

TITLE: Some estimates of the rate of disintegration of the surface of large meteorites traveling through the atmosphere at supersonic speeds

SOURCE: AN SSSR. Komitet po meteoritam. Meteoritika, no. 24, 1964. Trudy\* Desyatoy Meteoritnoy konferentsii v Leningrade 29 maya - 1 iyunya 1962 g., 70-74

TOPIC TAGS: meteor, shock wave, meteor ablation, meteor reentry

ABSTRACT: The rate at which a meteor traveling at supersonic speeds disintegrates has been considered. The heating of the meteoric mass, caused by its reaction to a self-generated shock wave, can be studied as a nonlinear problem of a body with variable thermal conductivity and has simple centered solutions. In order to have a considerable rate of surface disintegration, the optical thickness of the layer between the shock wave and meteor must not exceed 5-8.

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ACCESSION NR: AT4035830

This indicates that when the rate of disintegration is  $\sim 10^2$  cm/sec, a meteor which consists of ice materials and has an initial velocity of 30 km/sec loses its mass fully in 10 sec. The mass destruction rate of the meteor is increased by fragmentation under high pressures developed by the shock wave, reaching 1000 atm. These factors are probably responsible for the fact that high-velocity meteors, which penetrate the atmosphere, can be fully destroyed without reaching the earth. Orig. art. has: 19 formulas and 1 table.

ASSOCIATION: none

SUBMITTED: 00

DATE ACQ: 28May64

ENC~~L~~: 00

SUB CODE: AA

NO REF SOV: 012

OTHER: 000

Card 2/2



L 65296-65 EWT(1)/FCC/EWA(h) GW  
ACCESSION NR: AP5020992

UR/0203/65/005/004/0626/0644  
550.388.2

AUTHORS: Pletnev, V. D.; Skuridin, G. A.; Shalimov, V. P.; Shvachunov, I. H. <sup>44,55</sup>

TITLE: Dynamics of the geomagnetic trap and the origin of earth's radiation belts <sup>44,55</sup>

SOURCE: Geomagnetizm i aeronomiya, v. 5, no. 4, 1965, 626-644

TOPIC TAGS: magnetic field, Van Allen belt, magnetic trap, geomagnetic field, charged particle concentration, magnetic storm, solar burst

ABSTRACT: The interaction of solar corpuscular streams with the geomagnetic field is discussed with explanations about the formation of the earth's magnetosphere and the mechanism of charged particle penetration into the magnetosphere. The scalar potential of the geomagnetic field inside the earth's magnetosphere is expressed in spherical harmonics, and the solar particle stream--geomagnetic field interaction is described by the model shown in Fig. 1 on the Enclosure. In order to analyze the possibility of particle penetration into the magnetosphere, the following equation is solved numerically <sup>44,55</sup>

$$\frac{p}{r^3} - \alpha p + \frac{2y}{p} = \pm 1$$

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ACCESSION NR: AP5020992

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where  $\gamma$  is the Störmer integration constant,

$$\alpha = \frac{M_1}{2M_0 r_0^3}$$

and M is the magnetic moment of the earth's dipole. It is shown that the only particle penetration occurs in the vicinity of the neutral points AA', in the diurnal side of the magnetosphere. This penetration creates gradient and radius of curvature drift of charged particles, resulting in the formation of magnetic field neutral layers and a plasma wake in the equatorial plane in the night side. Data are reported from the Electron-2 artificial satellite in support of this argument. These trapped particles are shown to be responsible for auroral phenomena and magnetic storms. The inverse phase of the magnetic storm is connected with the sharp drop in solar particle emission at the magnetosphere boundary and a decay in trapped particle drift currents on the geomagnetic trap boundaries. This magnetic decay causes particle drifts into the magnetic trap with a corresponding particle acceleration. This explains the experimental observation of increased intensity of high-energy particle flow in the outer regions of the trap during the reverse phase of magnetic storms. "The authors express their gratitude to Sh. Sh. Dolginov, Ye. G. Yeroshenko, L. N. Zhuzgov, O. L. Vaysberg, K. I. Gringadze, K. Z. Khokhlov, I. A. Savenko, and B. I. Savin for providing the experimental results and evaluating

Card 2/4

L 65296-65

ACCESSION NR: AP5020992

44/55 24 44/55  
this work. The authors thank also Ya. L. Al'pert, B. A. Tverskiy, B. V. Chirikov, V. I. Volosov, V. I. Krasovskiy, Ya. I. Gal'perin, V. V. Temnyy, and other colleagues for taking part in evaluating this work and also L. A. Kazanova for reviewing this material and for formulating this paper." Orig. art. has 22 formulas, 14 figures, and 1 table.

ASSOCIATION: none

SUBMITTED: 06Apr65

ENCL: 01

SUB CODE: ES, AH

NO REF SOV: 026

OTHER: 012

Card 3/4

L 65296-65

ACCESSION NR: AP5020992

ENCLOSURE: 01

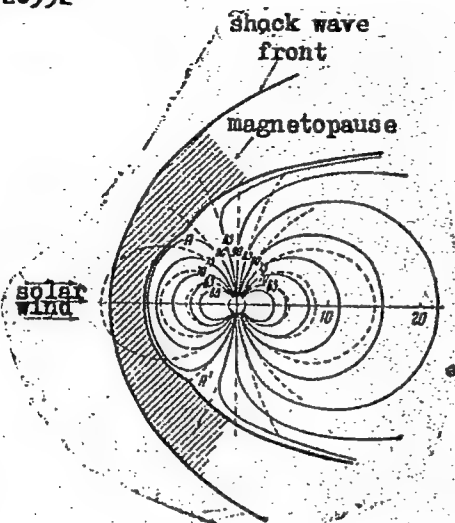


Fig. 1

Card 4/4

L-49441-65 EWT(1)/EWG(v)/FCC/EEC-4/EEC(t)/EWA(h) Po-4/Pe-5/Pq-4/Pae-2/Feb/  
P1-4 GW

ACCESSION NR: AP5009654

UR/0293/65/003/002/0336/0340

AUTHOR: Pletnev, V. D.; Shuridin, G. A.; Shalimov, V. P.; Shvachunov, I. N. 44  
B

TITLE: Dynamics of the geomagnetic trap and the origin of radiation belts

SOURCE: Kosmicheskiye issledovaniya, v. 3, no. 2, 1965, 336-340

TOPIC TAGS: magnetosphere, solar wind, geomagnetic field, magnetic storm, force line, proton belt, electron belt

ABSTRACT: The boundary of the magnetosphere created by the interaction between the solar wind and the geomagnetic field reaches a distance of 10 terrestrial radii on the day side of the earth. Electric currents on the boundary increase the magnetic field there. On the night side the magnetosphere is very extended. A particle may pass through the boundary of the magnetosphere because of a radial drift of the particle in an asymmetric magnetic field. The physical processes are studied in a magnetic field from parallels  $\pm 70^\circ$ . The regions permitting and prohibiting particle motion are determined,

Card 1/2

1. 6941.55  
ACCESSION NR: AP5009654

following Stormer's theory. Boundary currents diminish the magnetic field at neutral points. This effect shows up in the beginning of a magnetic storm. The combination of the current field and the dipole serves to straighten the force lines in the magnetosphere and stretch them towards the solar wind. The proton belt is nearer the earth than the electron belt. Orig. art. has: 3 figures and 2 formulas. [EG]

ASSOCIATION: none

SUBMITTED: 31Dec64

ENCL: 00

SUB CODE: AA, ES

NO REF SOV: 004

OTHER: 011

ATD PRESS: 3245

Card 2/2

L 61001-65 EWT(1)/EWG(v)/ECC/EEC-4/EWA(h) Po-4/Pe-5/Pq-4/Pae-2/Peb/Pi-4 GH  
ACCESSION NR: AP5018435 UR/0384/65/000/003/0018/0026 49

AUTHOR: Skuridin, G. A. (Doctor of physico-mathematical sciences); Pletnev, V. D.  
(Candidate of physico-mathematical sciences); Shalimov, V. P.; Shvachunov, I. N.  
TITLE: Solar wind, magnetosphere, and the Earth's radiation belt

SOURCE: Zemlya i Vseleennaya, no. 3, 1965, 18-26

TOPIC TAGS: solar wind, earth magnetosphere, magnetic storm generation, geomagnetic field perturbation, aurora

ABSTRACT: This is the first part of a study in which, on the basis of experimental data from Soviet and US satellites, the authors advance the hypothesis that all the complex geophysical effects such as the aurora polaris, magnetic storms, dynamics of the radiation belt, and the dynamics of the geomagnetic field, are basically determined by the interaction of the solar corpuscular flows with the Earth's magnetic field. A survey is made of the available experimental and theoretical data on the solar wind and the Earth's magnetosphere. Orig. art. has: 7 formulas and 9 figures.

ASSOCIATION: None

SUBMITTED: 00

ENCL: 00

SUB CODE: ES

NO REF SOV: 000

OTHER: 000

Card 1/1 *llc*

L 3494-66 ENT(1)/EMP(m)/FS(v)-3/FCC/ENA(d)/ENA(h) GW

ACCESSION NR: AP5024184

UR/0384/65/000/004/0012/0022

AUTHORS: Skuridin, G. A. (Doctor of physico-mathematical sciences); Pletnev, V. D. (Candidate of physico-mathematical sciences); Shalimov, V. P.; Shvachunov, I.

N.

TITLE: Solar wind, magnetosphere, and Van Allen belts of the earth

SOURCE: Zemlya i vseleennaya, no. 4, 1965, 12-22

TOPIC TAGS: solar wind, Van Allen belt, magnetosphere, high energy electron, magnetic field, magnetic trap

ABSTRACT: The structure of the earth's Van Allen belts was studied in some detail. In order to understand the trapping of charged particles by the earth's magnetic field the fundamental principles of orbit theory are reviewed and the significance of adiabatic invariants discussed. Using a model for the magnetosphere, the various charged particle drifts are analyzed in nonhomogeneous magnetic field traps. It is shown that the Van Allen belts are divided into inner and outer zones with altitudes at the equator ranging from 600 km in the western hemisphere to 1600 km in the eastern hemisphere. This discrepancy is due to the inhomogeneity

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L 3494-66

ACCESSION NR: AP5024184

in the earth's magnetic field. In the inner zone, electrons possess the highest energies (600 kev for  $10^8$  particles/cm<sup>2</sup>/sec). The outer zone has two maxima, the first of which occurs at three earth radii with proton energies of 150 kev to 4.5 Mev. The second maximum occurs at 4.5 earth radii with 40 kev electrons. During magnetic storms, the trapping field strength increases because of compression of lines of force. As a consequence of this, particle energy increases and the location of energy maxima move closer to the earth's surface. The interaction of cosmic rays with the terrestrial atmosphere generates yet a third type of particle--the neutron, which eventually decays into a proton and an electron. Although this decay contributes to the number of trapped particles in the Van Allen belts, it does not explain the overall charged particle injection process into the magnetic traps. To explain this phenomenon, a new hypothesis is presented where charged particle injection is associated with a betatron acceleration during the reverse phase of a magnetic storm. Orig. art. has: 16 figures.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: ES

NO REF SOV: 000

OTHER: 000

Card 2/2 *DP*

L 1281-66 ENT(1)/FCC/EWA(h) GS/GW

ACCESSION NR: AT5023599

UR/0000/65/000/000/0285/0314

AUTHOR: Pletnev, V. D.; Skuridin, G. A.; Shalimov, V. P.; Shvachunov, I. N.

TITLE: How solar particles break through into the earth's magnetosphere, the mechanisms by which these particles are captured and accelerated, and the part played by these processes in the dynamics of the geomagnetic trap

SOURCE: Vsesoyuznaya konferentsiya po fizike kosmicheskogo prostranstva. Moscow, 1965. Issledovaniya kosmicheskogo prostranstva (Space research); trudy konferentsii. Moscow, Izd-vo Nauka, 1965, 285-314

TOPIC TAGS: geomagnetic field, solar wind, solar radiation, geomagnetism, charged particle, particle motion, magnetic storm

ABSTRACT: The authors consider the interrelationship between geophysical phenomena which take place in outer space in the vicinity of our planet with regard to the dynamics of the geomagnetic trap. The classical Störmer method is used for analyzing the motion of charged particles in the magnetospheric field. It is found that solar particles cannot break through into the magnetosphere in the central region on the daylight side even in the initial phase of a magnetic storm, but that these particles

Card 1/3

L 1281-66

ACCESSION NR: AT5023599

30

easily penetrate deeply into the geomagnetic trap during the main phase of such a storm. A theory is proposed for penetration of the magnetosphere by charged particles in the vicinity of neutral points. It is found that since there is no magnetic reflection in this case, particles with a constant positive velocity can penetrate the magnetosphere, the greatest probability being for particles moving in the plane  $\alpha = 0$ . The distribution of drift currents is determined for particles inside the magnetosphere. Experimental data are given which confirm the theory proposed in this paper for penetration of the magnetosphere by charged particles. "The authors take this opportunity to express their gratitude to Sh. Sh. Dolginov, Ye. G. Yeroshenko, L. N. Zhuzgov, K. I. Gringauz, O. L. Vaysberg, I. A. Savenko and B. I. Savin for the experimental data given in this paper, and also for discussing the proposed theory. The authors are also grateful to Ya. L. Al'pert, B. R. Chirikov, M. Z. Khokhlov, B. A. Tverskiy, V. I. Krasovskiy, Yu. I. Gal'perin, V. V. Temnyy and others who took part in discussing this work while it was being prepared for the press. The authors also thank L. A. Kazenova for her great assistance in analyzing the materials and in the final layout of the article." Orig. art. has: 8 figures, 2 tables, 24 formulas. [14]

ASSOCIATION: none

Cord 2/3

L 1281-66

ACCESSION NR: AT5023599

SUBMITTED: 02Sep65

ENCL: 00

SUB CODE: ES, NP

NO REF SOV: 009

OTHER: 030

ATD PRESS: 4102

*mer*  
Card 3/3

CHADIN, G.A., doktor fiziko matematicheskikh nauk; PIETNEV, V.D.,  
kand. fiziko-matem. nauk; SHALIMOV, V.I.; SEVACHUNOV, I.N.

Solar wind, magnetic shell and radiation belt of the earth.  
(conclusion). Zem. i vesl. 1 no.4-12-22 51-Ag '65.  
(MIRA 18:12)

L 36947-66 EWT(1)/FCC GW  
ACC NR: AP6019592

SOURCE CODE: UR/0293/66/004/003/0394/0403

AUTHORS: Shalimov, V. P.; Shvachunov, I. N.

ORG: none

TITLE: Charged particle motion study in a dipole magnetic field occurring inside the magnetic field, using the Stormer method. 2

SOURCE: Kosmicheskiye issledovaniya, v. 4, no. 3, 1966, 394-403

TOPIC TAGS: magnetic field, dipole, particle trajectory, magnetic trap, magnetosphere

ABSTRACT: The results of Part I (V. P. Shalimov and I. N. Shvachunov. Kosmich. issled. 4. No. 2, 208, 1966) are used to study charged particle orbits emanating from the sun and entering the G-zone of the terrestrial magnetosphere. Inside this region the magnetic field potential is approximated by the sum of a dipole field and a homogeneous field, or

$$U = U_0 + U_1 = -\frac{M_0}{r^2} \sin \varphi - \frac{M_1}{r_0^3} r \sin \varphi.$$

Using Equation 15 of Part I, the various boundaries delineating the forbidden and allowed zones for particle trajectories are evaluated. First, the case of periodic trajectories is considered, corresponding to proton energies  $E_p \geq 730$  Mev at  $r_0 = 10a$  and  $E_p \geq 2.9$  Bev at  $r_0 = 6a$  ( $a$  = earth's radius, and  $r_0$  = distance to the magnetosphere).

UDC: 550.385.41

Card 1/2

ACC NR: AF3039404

SOURCE CODE: UR/0293/66/004/005/0788/0790

AUTHOR: Popovnikov, A. I.; Shalimov, V. P.

CRC: none

TITLE: Concerning the anomalous diffusion of charged particles in the magnetosphere of the Earth

SOURCE: Kosmicheskoye issledovaniya, v. 1 no. 5, 1966, 788-790

TOPIC TAGS: earth magnetic field, space charge density

ABSTRACT: V. A. Pavlov (see his Issledovaniya kosmicheskogo prostranstva - Investigations of cosmic space, Publ. House "Nauka", 1965) derived the basic equation for the transfer of charged particles across the drift shells of the magnetic field of the earth under the action of azimuthally asymmetric magnetic pulse-like perturbations. The present author applies this theory to protons of energy over 0.1 Mev and compares the results with the experimentally measured proton intensities obtained by the Explorer 12. There are systematic deviations between the theoretical and experimental data. Orig. art. has: 1 figure and 8 equations.

SUB CODE: 29,03/ SUBM DATE: 03Jun66/ ORIG REF: 004/ OTH REF: 005

Cord 1/1

UDC: 550.385.41

YURCHENKO, I.F.; OKUNEV, P.F., starshiy mekhanik; TOLKACHEV, V.P., inzh.;  
BYCHKOVSKIY, A.V., kand.tekhn.nauk; GORBATYUK, V.A., inzh.;  
LAGUN, Ya.I., starshiy inzh.; SHALIMOV, V.S., inzh.; DANILOV,  
V.I., inzh.

Replies to the inquiries of our readers. Elek. i tepl. tiaga  
5 no.6:41-43 Je '61. (MIRA 14:10)

1. Nachal'nik Upravleniya truda, zarabotnoy platy i tekhniki  
bezopasnosti Ministerstva putey soobshcheniya (for Yurchenko).
2. Otdeleniye avtotormoznogo khozyaystva Vsesoyuznogo nauchno-  
issledovatel'skogo instituta zheleznodorozhnogo transporta Min-  
isterstva putey soobshcheniya (for Okunev). 3. Otdel glavnogo  
tekhnologa Perovskogo zavoda po remonty elektropodvizhnogo  
sostava (for Lagun).

(Diesel locomotives)  
(Railroads--Rolling stock)



RABINOVICH, Nisan Borukhovich; SHALIMOV, Yu.B., red.

[High speeds in well drilling] Vysokie skorosti prokhodki  
skvazhin. Elista, Kalmagosizdat, 1964. 34 p.  
(MIRA 18:3)

003/011/018/056  
003/011/018/056

AUTHORS: Verner, V. D., Finkel'shteyn, B. N. and Shalimova, A. V.

TITLE: Study of behavior of nitrogen in Fe alloys having face-centered lattice by using the method of internal friction

PERIODICAL: Fizika tverdogo tela, v.3, no. 11, 1961, 3363-3366

TEXT: The authors investigated the internal friction of Fe + 30% Ni, Fe + 20% Ni + 9% Mn, Fe + 28% Mn alloys and of electrolytic iron as a function of temperature. Wire-type samples of 0.7 mm diameter were annealed before testing in moisture-laden hydrogen in order to remove carbon and nitrogen. K. M. Rozin and B. N. Finkel'shteyn (DAN SSSR, 91, no. 4, 811, 1953) discovered a carbon peak of internal friction in type 25-20 austenite steel. Ke-Ting-sui, Wang Chien-mei (Scientia Sinica, 4, 501, 1955) found similar peaks in nickel and alloys with face-centered lattices. The internal friction was measured as a function of temperature by employing a vacuum-type torsion pendulum of type P4-MWC (RKF-MIS). The samples investigated were nitrided to a depth of 0.20 - 0.25 mm. After tempering from the nitriding temperature, the surface layer consists of

Card 1/4

S/181/61/003/011/018/056

Study of behavior of nitrogen in Fe alloys...B125/B104

at 950°C it is given as  $D = 1.26 \cdot 10^{-8} \text{ cm}^2/\text{sec}$ . Peaks found by the authors are caused by diffusion of nitrogen atoms in face-centered lattices under the action of elastic stresses. There are 5 figures, 1 table, and 11 references: 7 Soviet-bloc and 4 non-Soviet-bloc. The three most recent references to English-language publications read as follows: J. L. Snoek. Physica, 8, 711, 1941.; C. Wert. Phys. Rev., 79, No. 4, 601, 1950.; J. D. Fast, M. V. Verripr. J. Iron and Steel Inst., 176, 24, 1954.

ASSOCIATION: Moskovskiy institut stali im. I. V. Stalina (Moscow Steel Institute imeni I. V. Stalin)

SUBMITTED: June 5, 1961

Fig. 1. Temperature dependence of internal friction of nitrided iron. After quenching from 700°C: (1) Heating, (3) cooling; after quenching from 700°C and cold treatment, (2) heating, (4) cooling; after a third quenching from 700°C; (5) heating.

Card 3/4

KUGAYENKO, O.M.(Moskva); ROZENBERG, V.M.(Moskva); SHALIMOVA, A.V.(Moskva)

Density of slip traces on the surface and in the body of a specimen.

Izv. AN SSSR.Otd.tekh.nauk. Met. i topl. no.5:126-127 S-0 '62.

(MIRA 15:10)

(Deformations (Mechanics)) (Metallography)

L 14298-63

EWf(q)/EWT(m)/BDS AFPTC/ASD JD

8/0126/63/015/004/0612/0615

ACCESSION NR: AP3000105

AUTHORS: Kugayenko, O. N.; Rozenberg, V. M.; Shalimova, A. V.

TITLE: Influence of initial substructure on the process of creep

SOURCE: Fizika metallov i metallovedeniye, v. 15, no. 4, 1963, 612-615

TOPIC TAGS: creep, substructure change

ABSTRACT: Changes in the artificially produced substructure of iron silicide polycrystals (3.4% Si) have been studied by the dislocation etching method. The results obtained were compared to those of a sample annealed at 1200C and practically free of substructure. The substructural variations have been evaluated quantitatively. A load of 1.5 kg/Sq mm applied to more highly developed substructures (greater degree of deformation) resulted in a smaller deformation during the creep. However, under the action of a 2.5 kg/Sq mm load the annealed sample and those with an induced substructure behaved almost identically. During the creep process an ever-increasing number of subboundaries was formed in the annealed sample. The opposite was true for samples with established initial substructures, in which the number of subboundaries diminished to the number in the annealed sample. The authors conclude that the substructure formed during creep does not

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L 14298-63

ACCESSION NR: AP3000105

depend on the initial substructure. When the substructures of different samples become alike their creep velocities become equal. The results obtained with the 2.5 kg/Sq mm load show that under sufficiently high loads the subboundaries either cease to be an obstacle to deformation, or that the initial substructure changes too rapidly (approaching that of the annealed sample) for its effect to be detected. The time interval required for reaching the point of failure is different in different samples. This is explained by the effect of the initial substructure. Orig. art. has: 5 figures.

ASSOCIATION: Institut metallofiziki TANIICHM (TANIICHM Institute of Physical Metallurgy)

SUBMITTED: 16Jul62

DATE ACQ: 12Jun63

ENCL: 00

SUB CODE: ML

NO REF SOV: 004

OTHER: 001

Card 2/2

SHALIMOVA, G. G.

USSR/Physical Chemistry - Crystals, B-5

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 60934

Author: Ornatskaya, Z. I., Shalimova, G. G.

Institution: None

Title: Electric Properties of Sodium-Tungsten Bronze and of the System  
Sodium Tungstate-Sodium Tungsten Bronze

Original  
Periodical: Nauch. yezhegodnik za 1954 g. Saratovsk. un-ta, Saratov, 1955,  
627-629

Abstract: One of the components --  $\text{Na}_2\text{WO}_4$  ( $\frac{1}{2}$ ) -- has a typical semiconductor conductivity. Investigation of conductivity of the other --  $\text{Na}_2\text{WO}_3$  (II) -- (tungsten bronze) showed: specific electric conductivity  $\sigma$  is 2 orders lower than according to the data of Haegg (Haegg, G., Z. phys. chem., 1935, B29, 192);  $\sigma$  increases in temperature interval between room temperature and  $215^\circ\text{C}$ - $250^\circ\text{C}$ , after which up to  $530^\circ\text{C}$  it remains almost constant; temperature coefficient of  $\sigma$  is 1.1-0.9, dissociation energy  $\Delta E \approx 0.2$  ev. Measurements were made

Card 1/2

COLOME, L.M.; Prinimali uchastiye: BYKOVA, L.I.; SHALIMOVA, G.V.:  
NESKORODEVA, V.I.; KOVZHIN, L.A.

Structural and mechanical properties of vat brilliant green Zh as  
suspensions or pastes. Khim.prom. no.8:531-535 Ag '61.  
(MIRA 14:8)

1. Filial Gosudarstvennogo nauchno-issledovatel'skogo instituta  
organicheskikh poluproduktov i krasiteley, g. Rubezhnoye.  
(Dyes and dyeing)



VINOGRAD, L.Kh.; KARPOV, V.V.; SHALIMOVA, G.V.

2-anilino-1,4-naphthoquinones. Zhur. prikl. khim. 34 no. 12:2775-2779  
D '61. (MIRA 15:1)

1. Rubezhanskiy filial Gosudarstvennogo nauchno-issledovatel'skogo  
instituta organicheskikh poluproduktov i krasiteley.  
(Naphthoquinone)

GOLOMB, L.M.; SHALIMOVA, G.V.\_

Determining the relative reduction rate of vat dyes in printing  
pastes. Tekst.prom. 22 no.9:25-29 S '62. (MIRA 15:9)

1. Sotrudniki Rubezhanskogo filiala Nauchno-issledovatel'skogo  
instituta organicheskikh poluproduktov i krasiteley.  
(Textile printing) (Dyes and dyeing)



GOLOMB, L.H. [Golomb, L.H.], hard. volim. mark; SHALIMOVA, G.V. [Shalimova, H.V.]

Potentiometric method for determining the oxidation-reduction  
properties of vat dyes. Lek. prom. no.4:50-54 C-B '65.  
(HUPA 19:1)

SHALIMOVA, K. V.

USSR/Physics  
Luminescence  
Phosphors

Nov 48

PA 51/49T66

"Temperature quenching of photoluminescence of the  
Sublimate Phosphor KI+Tl," K. V. Shalimova,  
Sibirsk Physicotech Inst, Tomsk State U, 4 pp

"Zhur Eksper i Teoret Fiz" Vol XVIII, No 11  
P. 1945-8

Shows that temperature quenching of photolumines-  
cence occurring in the sublimate phosphor KI+Tl,  
prepared in air, obeys Mott's equation. Activation  
energy depends on wave length of exciting light and  
activator concentration -- the greater the  
activator concentration, the less the activation  
energy. Coefficient C, indicating bond of ad-  
mixture with crystal lattice, remained constant  
for all wave lengths of the exciting light for a  
given activator concentration and decreased with  
increase in activator concentration. Submitted  
20 Jun 48.

51/49T66

SHALIMOVA, K. V.

Shalimova, K. V. "The ratio between temperature and the amount of  
the photoluminescence of KJ/PL sublimate of phosphorous," Trudy Sib. fis.-  
mat. nauch. tsentr. Issue 26, 1943, p. 160-67, - Bibliogr. p. 167

SC: U-5221, December 11, 1963, (Letopis 'Zhurnal Vykh. Statey, no. 26, 1949)

SHALIMOVA, K. V.

PA 35/49T84

USSR/Physics  
Phosphorus  
Luminescence

Aug 48

"The Intensity Distribution in the Spectrum of Photoluminescence of Sublimated Phosphorus KI/Tl," K. V. Shalimova, Siberian Physicotech Inst, Tomsk State U  
ment V. V. Kuybyshev, 3 pp

"Dok Ak Nauk SSSR" Vol LXI, No 6

613.452

61.1031-3

Detailed study of the influence of excitation wave length on spectral distribution of photoluminescence in sublimated phosphorus KI/Tl. Establishes dependence of spectral distribution of photoluminescence on excitation wave length and concentration of the activator. Submitted by Acad A. M. Terenin, 25 Jun 48.

35/49T84

SHALIMOVA, K. V.

61/49T103

USSR/Physics

Aug 49

Luminescence

Temperature

"Temperature Dependence of the Radiation Spectra of the 'Sublimate-Phosphor' KI-Tl," K. V. Shalimova, Siberian Physicotech Inst, Tomsk State U, 3 pp

"Zhur Eksper i Teoret Fiz" Vol XIX, No 8

Studied effect of temperature upon spectral distribution of the photoluminescence of crystalline KI-Tl films. Temperature dependence of luminescence spectra explains changes of radiation of the KI-Tl monocrystal observed during a change in temperature. Submitted 11 Apr 49.

61/49T103



FA 46/49191

USSR/Physics  
Luminescence  
Spectra, Absorption

Jan 49

"Dependence of the Spectra of Absorption, Excitation, and Photoluminescence of the Sublimate KI-F1 Upon the Activator Concentration," K. V. Shalimova, Siberian Physicotech Sci Res Inst, Tomsk State U imeni V. V. Kuybyshev, 4 pp

"Dok Ak Nauk SSSR" Vol LXVI, No 4

Studied spectral distribution of absorption, excitation, and photoluminescence of films having different concentrations of the activator.

46/49191

USSR/Physics (Contd)

Jun 49

Compared this with spectra of alkali-haloid monocrystalline phosphors activated with thallium and water solutions of their salts to determine nature of absorption and radiation center (atom or ion) in a sublimate phosphor. Submitted by Acad S. I. Vavilov, 4 Mar 49

SHALIMOVA, K. V.

46/49191

USSR/Physics  
Luminescence

Jun 49

"Photoluminescence of a Sublimate-Phosphor NaI-Tl," K. V. Shalimova, Siberian Physicotech Inst, Tomsk State U imeni V. V. Kuybyshev, 3 $\frac{1}{2}$  pp

"Dok Ak Nauk SSSR" Vol. LXVI, No 5

Demonstrates experimentally that in crystal lattices of NaI and Tl which are disturbed by great concentrations of catalysts, electronic levels of the thallium ion are subject to the splitting characteristic of electric fields. Submitted by Acad S. I. Vavilov, 4 Apr 49.

50/49T98

Absorption and emission spectra of the sublimate phosphor KCl-Tl. K. V. Shalimova (Tomsk Gosudarst. Univ. im. V. V. Kulyshcheva). *Doklady Akad. Nauk S.S.S.R.* 70, 225-8 (1959).—Evapd. films with a low Tl content show 2 absorption maxima, at 2430 and 2500 Å., as against the single max. at 2475 Å. observed in the single crystal. This absorption is due to a transition of  $Tl^{+}$  from  $6s^2\ ^1S_0$  to  $6s6p\ ^1P_1$ , with the latter, excited level suffering a split into a doublet in the asymmetrical field of the lattice in the film. Further absorption maxima are

found at 2250 and at 2750 Å. In emission, in excitation with 2482 and 2537 Å., there are 3 maxima, at about 3000, 4700, and 7000 Å., the 1st 2 of which had also been observed in single crystals. The 3000-Å. band is much more intense than the 7000-Å. band. At medium Tl contents, the 2 absorption maxima are somewhat shifted, to 2420 and 2530 Å., resp., with the longer-wave component more intense than the shorter-wave component, in reversal of the intensity ratio found at low Tl contents. In emission, blue in excitation with 2537 and yellow in excitation with 2652 and 2802, the 3 maxima lie at about 3000, 5300, and 7000 Å. Variation of the wave length of the exciting light results only in a redistribution of the relative intensities of the 3 emission maxima. This, in conjunction with analogous findings with KCl-Tl and NaI-Tl films, indicates that the 2750-Å. absorption band corresponds to the forbidden transition  $6s^2\ ^1S_0 \rightarrow 6s6p\ ^1P_1$ , with the prohibition lifted in the asymmetrical field of the lattice in the film. This addn. absorption band is responsible for the infrared emission band. At high Tl contents, absorption in 2750 Å. becomes more intense. Excitation with 2537, 2652, or 2802 Å., produces only yellow luminescence. Only 2 maxima are found in emission, 5300 and 7000 Å., with the latter more intense. The absorption spectrum shows bands at 2400, 2500, 2800; 1950, 2000; 2100, 2160, 2240 Å. The short-wave band pair 1950, 2000, is assigned to the transition  $6s^2\ ^1S_0 \rightarrow 6s6p\ ^1P_1$ , the latter level splitting into a doublet. The corresponding effect in a single crystal is the asymmetry of the 1900-Å. absorption max., appearing at Tl contents of  $10^{-3}$  mol. %. The group of bands 2100, 2160, and 2240 Å. corresponds to the 2100-Å. band of the single crystal, and is due to a lifting of the prohibition  $6s^2\ ^1S_0 \rightarrow 6s6p\ ^1P_1$ , and splitting of the latter level into a triplet. N. Thon

SHALIMOVA, K. V.

PA 175T78

USSR/Physics - Phosphors

1 Apr 50

"Dependence of Absorption Spectra of Alkali-Halide Sublimate-Phosphors Activated by Tellurium Upon Temperature," K. V. Shalimova, Siberian Physicotech Inst, Tomsk State U imeni Kuybyshev

"Dok Ak Nauk SSSR" Vol LXXI, No 4, pp 651-653

Studies KI-Tl, NaI-Tl, KBr-Tl, KCl-Tl films at temp of 500-600°. Relative coeff of absorption ( $K_d$ ) vs wave length (2,200-3,000 Å) are detd for these phosphors. Submitted 6 Feb 50 by Acad S. I. Vavilov.

175T78

1. CHALIKOVA, K. V.
2. USSR (400)
4. Phosphors
7. Nature of the brief luminescence of crystalline phosphors, Izv. AN SSSR Ser. fiz., 15 No. 5, 1951.
9. Monthly List of Russian Accessions, Library of Congress, April 1953, Uncl.

1951

**Nature of the photoluminescence of silver activated silver halide sublimate phosphors** K. A. Shalimova and A. V. Belkina (Tomsk State Univ.), *Zhur. Eksp. i Teor. Fiz.* 21, 326-35 (1951). Vacuum-sublimed films of white AgCl prep. in the dark may be white, violet, or rose, the color indicates the presence of colloidal Ag produced in the sublimation. After irradiation with ultraviolet, the white films show a liquid air temp. intense green luminescence, which gradually decreases with rising temp. Films made with the violet AgCl, obtained by ultraviolet irradiation of white AgCl, or with AgCl prep. in the presence of light, show at liquid-air temp. turquoise-blue emission, going over into green at higher temp.; in excitation with 3650 Å., at liquid-air temp., the emission is blue-green. Films of deep blue AgCl, obtained by prolonged ultraviolet irradiation of white AgCl, have a turquoise blue and, at some points, red luminescence, with rising temp., the former emission recedes, and the red luminescence increases, but it is hardly quenched with a further rise in temp. AgCl sublimed with metallic Ag shows turquoise-blue emission, going over into red at higher temp. AgCl sublimed in Cl<sub>2</sub> and consequently free from excess Ag atoms, shows no luminescence at liquid-air temp. In absorption, AgCl sublimed in Cl<sub>2</sub> shows a max. at 2500 Å., which extends considerably further into the ultraviolet than in AgCl with excess Ag, and which falls sharply at the long-wave end. The white color of the nonexcess AgCl does not change even on fairly long irradiation with ultraviolet and no luminescence appears. Removal of Cl results in the appearance of luminescence at liquid-air temp. By their prepn., the films with green emission contain only small ams. of excess Ag. In absorption at room temp. they show 2 max. at 2800 Å. and 4100 Å., and at liquid air temp. also a 3rd wave length, the emission independent of the exciting wave length, they show only one max. at 5300 Å. After exposure to ultraviolet, the emission veers to blue, with a new addnl. emission max. appearing at 5800 Å., probably as a result of superposition of the nearby max. at 4800 Å. After prolonged exposure to 2537 Å., the violet band disappears completely, the green recedes, and the red grows; these effects increase with the length of the exposure. The sky-blue emission of

### Electronic Phenomena

the films made with blue AgCl corresponds to a medium content of excess Ag. The absorption is enhanced with the excess into 2 distinct bands, which are less marked, in the short-wave range, 2 addnl. max. appear at 2450 and 2750 Å., particularly distinct at liquid air temp. in the long wave range, instead of the one max. at 3400, several max. appear at 3100, 3400, 3650, 3850, 4100, and 4400 Å. In contrast to the low Ag films, the absorption curve at liquid air temp. now lies below that at room temp. Luminescence in excitation with 3125 Å. shows 2 max. at 4800 and 5800 Å., the latter increasing with the temp. The red luminescent high-Ag films of AgCl, obtained either by simultaneous sublimation of white AgCl and Ag or by sublimation of deep blue AgCl, have an absorption spectrum similar to that of the medium-Ag films, only with more distinct max. The emission spectrum shows 3 max. at 4800, 5200, and 6100 Å., with hardly any difference in the intensity distribution in excitation with 2537 or 2652 Å. The red band disappears if the film is left for some time in the light. At liquid-air temp., the turquoise-blue AgCl shows also noticeable photophorescence, with only turquoise blue but no red emission; phosphorescence in the dark shows only one narrow green band at 5100 Å. With higher free Ag contents, the green luminescence of AgBr at liquid air temp. disappears rapidly with rising temp., the red and the orange fluorescence decline with rising temp. much more slowly. The orange emission is also observed in phosphorescence. AgBr sublimed along with Ag shows only orange and red emission. Yellow-gray films of AgI prep. in the dark but sublimed in the light showed no fluorescence. Sublimed films of MnCl<sub>2</sub> at liquid-air temp. showed red fluorescence and phosphorescence; the fluorescence declines with rising temp. much faster than the turquoise blue fluorescence of AgCl. The absorption bands at 2900 and 4100 Å. of low Ag films of AgCl are linked with the transitions  $1s^2s \rightarrow 2s^2p$ ,  $1s \rightarrow 2p$ , and  $1s^2s \rightarrow 2p^2$ , with the  $P_{1/2}$  and  $P_{3/2}$  levels inde-

C. A.  
: 951

indistinguishable. Transitions between  $3p^2 4p^2$  and  $3p^2 4p^2$  are radiationless. With a higher excess of Ag double splitting of the  $4p^2$  level gives rise to triplet structure of  $3p^2 4p^2$  and  $3p^2 4p^2$ , which causes the appearance of the additional max. The temp dependence of the intensities of the kv-blue, the green, and the red emission bands is accounted for, according to Mott's (Proc. Roy. Soc. (London) 167A, 384 (1938)) scheme, by intersections of the potential curve of the blue emission with the ascending branch of the curve of the green emission, and of the latter with the ascending branch of the red emission which intersects the potential curve of the normal state. The red luminescence of the high-Ag films is accounted for by concentration quenching of the upper energy levels responsible for the short-wave max. At a very high content of excess Ag the min of the excitation energy levels lies beyond the points of intersection with the ascending branch of the potential curve of the normal state; luminescence disappears. The attribution, by Golub (C.S.I. 42, 667 (1950)) of the red luminescence of single crystals of  $\text{AgCl}$  to  $\text{MnCl}_2$  to  $\text{MnCl}_2$ , is correct only in the range from  $-180$  to  $-150^\circ$ ; between  $-50$  and  $-100^\circ$  the red emission is due to  $\text{AgCl}$ . The alleged nonvalidity of Lambert's Law asserted by Barschcheyskii (C.S.I. 44, 626 (1951)) for thin Ag halide layers is actually due to variations of the excess Ag content with the thickness. If the actual content of Ag were taken into account, Lambert's Law should be found valid. N. Thom

SHALIMOVA, K. V.

104T111

USSR/Physics - Luminescence, Zinc Oxide 21 Jun 51

"Spectra of Absorption and Radiation of Zinc Oxide,"  
K. V. Shalimova, Phys Inst imeni Lebedev, Acad Sci  
USSR

"Dok Ak Nauk SSSR" Vol LXXVIII, No 6, pp 1127-1130

Discusses results obtained in investigation of photoluminescence of ZnO, and offers possible explanation of this phenomenon. Worked at very low temps. Obtained positions of maxima in spectra that differ from those of other investigators. Cf. Loverenz, "An Introduction to Luminescence of Solids," London, 1950. Submitted 10 Apr 51 by Acad D. V. Skobel'tsyn.

184T111



Photoluminescence of sublimate phosphors of zinc sulfide and zinc selenide. K. V. Shalimova (P. N. Lebedev Phys. Inst., Moscow). *Doklady Akad. Nauk S.S.S.R.* 80, 587-49(1951).—(1) Treatment with S vapor of a Zn mirror condensed on quartz in a 10<sup>-4</sup>-mm. vacuum gives a ZnS film partly white and partly showing different colors in transmitted and in reflected light, owing to inclusion of colloidal metal particles. Both films are luminescent. The fluorescence of the white ZnS is orange-yellow, deeper than that of ZnO-Zn. A luminescent ZnS film can be obtained also by simultaneous distn. of Zn and S. The absorption spectrum shows maxima at 2840, 3130, and 3310 Å.; the emission maxima lie at 4550, 5350, and 5990 Å.; the latter being the highest. Nonluminescent white ZnS films (without excess Zn) have only 2 absorption maxima, at 2840 and 3130 Å. If the luminescent ZnS film is heated in *vacuo*, the colloidal inclusions disappear, and bright-green luminescence appears in addn. to the orange-yellow emission. In the absorption spectrum, bands characteristic of ZnS (3350, 3990, 3880 Å.) appear in addn. to the former 3 maxima. (2) Sublimation of nonluminescent ZnS gives a grayish powder with green fluorescence, a high emission max. at 5350 Å., and the same absorption bands as the luminescent ZnS film. (3) Sublimation of a ZnS-Zn phosphor, giving fluorescence max. at 4690 Å. and sky-blue phosphorescence, results in a phosphor with green-blue and, occasionally, orange-yellow emission; only the green-blue films show long-lived afterglow at liquid-air temp. The absorption and emission spectra are the same as with the foregoing luminescent ZnS-Zn, except that in the green-blue band the 4550-Å. max. is the highest. (4) ZnSe prepd. by treatment of a Zn-film with Se vapor shows bright-red luminescence, particularly intense at liquid-air temp. The emission spectrum is the same as that of finely cryst. ZnSe powder, with a narrow band at 6410 Å. (5) The transition from green to sky-blue to orange-yellow luminescence of ZnS corresponds to increasing amt. of excess Zn; the positions of the emission bands undergo no change, only the relative intensities vary. The absorption max. at 3140 Å., absent in nonluminescent but present in luminescent ZnS, belongs to the excess Zn. If so, irradiation of ZnS-Zn with 3140 Å. results in absorption by the activator and not by the host lattice, as is commonly assumed. Absorption in 3340 Å. corresponds to the transition of Zn from 4s<sup>2</sup> 4p<sup>2</sup> to 4s 4p<sup>2</sup>. N. Thun

[illegible]

SHALIMOVA, K.V., MENDAKOV, N.S.

Silver Iodide, Fluorescence

Photoluminescence of sublimate-phosphor of silver iodide. Dokl. AN SSSR, 82, No. 4, 1952.

Fizicheskiy Institute im. P.N. Lebedeva Akademii Nauk SSSR. I Sibirskiy Fiziko-Tekhnicheskiy Institute

pri Tomskom Gosudarstvennom Universitete im. V.V., Kuybysheva, rcd. 12, Nov. 1951

SO: Monthly List of Russian Accessions, Library of Congress, June 19<sup>52</sup>~~53~~, Uncl.

USSR/Physics - Phosphors

11 Feb 52

"Duration of the Excited State of Certain Phosphors," K. V. Shalimova, T. P. Belikova, Phys Inst Imeni Lebedev, Acad Sci USSR

"Dok Ak Nauk SSSR" Vol 82, No 5, pp 713-716

Authors' knowledge use of M. D. Galanin's "phase fluorometer" with which the measurements of tau, duration of excited state, were conducted. List 10 phosphors (KI-Tl, CsCl-Tl, ZnO-Zn, ZnS-Zn, CdI<sub>2</sub>-Cd, AgCl-Ag, AgBr-Ag, Al-Ag, CuCl-Cu, CuI-Cu),

230T96

illuminating light (green, yellow, blue, red), wave length, tau (duration, from  $10^{-6}$  to  $10^{-5}$ ).

Z. A. Trapeznikova prep'd the ZnS-Zn phosphor. State that purpose of this work is to verify the assumption concerning the intercombinational transition ( $^3P_1 - ^1S_0$ ) in the atoms. Submitted by

Acad G. S. Landsberg 15 Nov 51.

SHALIMOVA, K. V.

230T96

SHALIMOVA, K. V.

USSR/Physics - Photoluminescence

FD-626

Card 1/1 : Pub. 146-16/18

Author : Shalimova, K. V. and Mendakov, N. S.

Title : Photoluminescence of the halide salts of copper

Periodical : Zhur. eksp. i teor. fiz. 26, 248-253, February 1954

Abstract : The authors study absorption spectra and luminescence of halide salts of copper. It is shown that the luminosity of these salts is related to the surplus of copper above the stoichiometric composition. The data obtained on the spectra support the supposition that the absorption and radiation of these salts is provoked by the passages of an electron between the energy levels of a surplus copper atom which interacts with the field of a phosphor lattice.

Institution : Siberian Physicotechnical Institute, Tomsk State University

Submitted : April 28, 53

Shalimova, K. V.

USSR.

62  
Optical absorption and inherent photoelectric effect of zinc oxide. K. V. Shalimova (Eng.-Phys. Inst., Moscow). *Doklady Akad. Nauk S.S.S.R.* 96, 487-90 (1954).—Exptl. facts indicate a 2-stage process for cryst. phosphors. The present work had as its purpose the detn. of the nature of the recombination luminescence and the photoelec. effect for sublimate phosphors. ZnO films were selected, as ZnO has both fluorescence and phosphorescence within a 2840-3760-A. range of the activator. On the same samples of ZnO films, the spectral absorption curve and photocurrent were measured in relation to concn. of activator. The photoelec. susceptibility of the films was measured by the condenser method, but the absorption spectra were measured with a Beckmann spectrophotometer. ZnO films were smoked onto quartz plates by burning metallic Zn in a crucible in the air. If the film was deposited at the 1st moment of burning of the Zn, the resulting film was not luminescent nor did it show a photocurrent. For the nonluminescent film, the max. band of fundamental absorption came at 2500 A. Film samples contg. different amts. of activator were prepd. by placing the quartz plates inside the crucible at different distances above the heated Zn. Luminescence and photocurrent were observed for these films. In all the films studied a parallelism between the spectral absorption curves of the luminescence centers and the photocurrent curves was observed, and in the region of fundamental absorption the photosusceptibility of the substance decreased. The results obtained indicated that the inherent photoelec. effect and also, it is necessary to assume, the recombination luminescence in the ZnO sublimate-phosphor proceeds with the absorption of exciting light in the luminescence centers, formed stoichiometrically by excess Zn atoms. No ionization mechanism of the centers of emission was considered concretely because of lack of sufficient exptl. data.

Gulys S. Macy

SHALIMOVA, K. V.

1. Absorption Spectra of Ultra-Thin Metallic Films. K. V. Shalimova (Doklady Akad. Nauk S.S.S.R., 1954, 97, 157, 68-72). [in Russian]. To investigate the nature of the forces in the adsorption of metal atoms on the surface of cryst. quartz, Sh. measured the absorption spectra of very thin films of Ag, Cu, and Zn, deposited on quartz plates by evaporation in vacuo ( $10^{-6}$  mm. Hg). For Ag films with thickness  $t \approx 2-3$  Å. (at radius 1-45 Å.), there were max. at 2240, 3600, and 4900 Å., that at 4900 Å. (corresponding to colloidal particles) being the most intense. With increase in  $t$ , the max. at 3600 Å. became less marked, but that at 4900 Å. increased. Layers composed of coarse colloidal particles were dark blue, those of finer particles being yellow-orange. Films of Cu showed max. at 2300 and 3550 Å., in addn. to that at 6000-7000 Å. corresponding to colloidal particles (which became weaker as  $t$  decreased). The max. for Zn films (prepared by a special technique, because of difficulties in condensing the vapour) were at 2350 and 3250 Å., in addn. to that at 4000-5000 Å. for colloidal particles. Data are presented to show the similarity of the structures of adsorption spectra of adsorbed metal and of stoichiometrically excess metal acting as activator for a phosphor.

—G. V. E. T.

Sum *[initials]*

SHALIMOVA, K. V.

USSR/Physics

Card : 1/1

Authors : Shalimova, K. V.

Title : Effect of the inner-crystal lattice field of phosphorus on the electron levels of activators.

Periodical : Dokl. AN SSSR, 97, Ed. 3, 437 - 440, July, 1954

Abstract : Reviews and analyzes experimental data, printed in scientific magazines, concerning the effect of an inner-crystal field of phosphorus lattice on electron levels of activators. Taking the results of the experiments as a base, makes some assumptions concerning the characteristics of the chemical bonds between the lattice of a luminophore and an activator, namely, that absorption and emission bands of the activator should be larger and wider. Photo-diagrams and tables. Twenty-three references (eight Russian).

Institution : Moscow Physical-Engineering Institute

Presneted by : V. N. Kondrat'ev, Academician



Shalimova, K. V.

62 V Effect of crystal lattice fields upon emission and absorption spectra of silver, copper, zinc, and thallium ion. K. V. Shalimova (Eng.-Phys. Inst., Moscow). *Doklady Akad. Nauk S.S.S.R.* 97, 851-3(1954); cf. *C.A.* 44, 5712a; 45, 8357c; 46, 829c. — In lattices of AgCl, AgI, CuCl, and CuI the corresponding metallic atoms give triplets (energetically equiv. to transitions  $1^2S_{1/2} \rightarrow 2^2P_{3/2,1/2}$  and  $1^2S_{1/2} \rightarrow 3^2P_{3/2,1/2}$  of free gaseous Ag and Cu) with energy differences  $\Delta E$  between lower and upper level larger than those for the free atoms. Probably, in covalent lattices, as in an external electric field,  $LS$  coupling is destroyed and  $L + 1$  energy levels corresponding to  $2L + 1$  components are observed.  $Tl^+$  in KCl and KBr gives doublets,  $Tl^+$  in KBr, NaI, and KI-triplets (equiv. to  $^1S_0 \rightarrow ^1P_1$  and  $^1S_0 \rightarrow ^1P_1$  in free atoms). Zn in ZnO may give either doublets or triplets.  $\Delta E$  for  $Tl^+$  in alkali chlorides is smaller than  $\Delta E$  for free  $Tl^+$ ; the opposite is the case for Zn in ZnO. Ivan Pascal

SHALIMOVA, K.V.; KARPENKO, I.V.

Optical absorption and internal photoelectric effect of cadmium sulfide. Nauch.dokl.vys.shkoly; radiotekh. i elektron. no.2:233-242  
' 58. (MIRA 12:1)

1. Kafedra poluprovodnikovyykh priborov Moskovskogo energeticheskogo instituta.

(Cadmium sulfide--Optical properties)

24(4)  
AUTHORS: Shalimova, K.V., and Karpenko, I.V. SOV/162-58-3-24/26

TITLE: The Influence of Cadmium on the Electrical, Optical and Photo-Electrical Properties of Cadmium Sulfide  
(O vliyanii kadmiya na elektricheskiye, opticheskiye i photoelektricheskiye svoystva sul'fida kadmiya)

PERIODICAL: Nauchnyye doklady vysshey shkoly, Radiotekhnika i elektronika, 1958, Nr 3, pp 176-183 (USSR)

ABSTRACT: The authors investigated the light and dark conductances of CdS which are affected by the stoichiometric excess of Cd atoms for establishing an additional control of the conclusions concerning the light absorption and photoconductance of CdS, found in the visible range of the spectrum. The optical absorption of CdS has different values, depending upon the content of free Cd atoms. Further, a photo effect arises as a result of an ionization of excess Cd atoms when absorbing the excitation light. The authors conducted three series of experiments during their investigation. The first series of experiments

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SOV/162-58-3-24/26

The Influence of Cadmium on the Electrical, Optical and Photo-Electrical Properties of Cadmium Sulfide

was made for the determination of the heat influence on the photoconductivity of CdS. The second series of experiments dealt with the influence of radiation on the magnitude of photo-conductivity of CdS, whereby a PRK-4 mercury lamp was used. The third series of experiments explained the influence of metallic cadmium in the CdS lattice on the electrical and optical properties of the latter. The authors established that the electric conductance of CdS increases uninterruptedly with an increase of the metallic Cd concentration in its lattice, while the photosensitivity rises initially and decreases thereafter. CdS films containing a small amount of excess Cd atoms have a great light conductance, but a low dark conductance. CdS films having a sufficiently high number of excess Cd atoms have a lower light conductance, but show a considerable dark conductance. There are

Card 2/3